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MATERNAL ANAEMIA AS A RISK FACTOR FOR ADVERSE NEONATAL OUTCOME.

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ABSTRACT

INTRODUCTION: Pregnancy anaemia is a serious health concern and a leading cause of poor fetomaternal outcomes, particularly in underdeveloped countries. Anemia can cause infections, premature rupture of membranes, foetal growth limitation, foetal hypoxia, and other health problems for both the mother and the baby, preterm delivery, low birth weight, increased need for admission to NICU, fetal & neonatal death. **OBJECTIVE:** To study the association of maternal anemia with adverse neonatal outcome. **DETAILS OF THE Research:** This was a descriptive, cross-sectional study. **SETTINGS:** Women and Children Hospital, Abbottabad, Department of Obstetrics and Gynecology. **STUDY DURATION:** 1st December 2019 to 10th December 2020. **Materials & Methods:** A total of 170- women with pregnancy of gestational age >37 weeks, 19 to 40 years of age were included in the study. Patients with diabetes mellitus, Hypertension, CLD, and CRF were not included in the study. Hemoglobin was tested in blood samples taken in Ethylenediaminetetraacetic acid (EDTA) tubes. The degree of maternal anaemia was determined, as well as the neonatal prognosis. **RESULTS:** Maternal anaemia was linked to a greater risk of low birth weight (45.4%), early newborn mortality (13.6%), and increased admission to the neonatal intensive care unit (36.3%) in patients with severe anaemia. The link between mild or moderate anaemia and infant mortality was not significant. **SUMMARY:** Maternal anaemia raises the risk of low birth weight, premature birth, and perinatal death. Improving maternal nutrition and iron supplements during pregnancy can help to reduce these negative effects.

KEYWORDS: Anemia, neonatal outcome, neonatal intensive care unit(NICU)

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INTRODUCTION

Despite the fact that mother and child health programmes place a high focus on addressing anaemia, it affects 33% of the global population. 1,2. It is a serious public health issue that affects people of all ages, with the greatest rates among children under the age of five and pregnant women. If a pregnant woman's haemoglobin concentration is less than 11.0g/dL in the first and third trimesters of pregnancy, or less than 10.5g/dL in the second trimester, she is called anaemic. 3 The explanation for these disparities in pregnancy is that the 40

to 50 percent increase in plasma volume exceeds the 20 to 25 percent rise in red cell mass, resulting in physiological haemodilution. 4 According to the World Health Organization, anaemia affects roughly 14% of pregnant women in industrialised nations, whereas it affects up to 51% of pregnant women in underdeveloped countries. 2 In Southeast Asia, the situation is far worse. South Asian nations account for over half of all maternal fatalities worldwide due to anaemia. 4 Iron deficiency is the leading cause of anaemia in

pregnancy, accounting for around 95% of cases.

The capacity of the foetus to extract its need in an obligatory direction from a mother whose body iron levels are already reduced exaggerates iron deficit during pregnancy. Anemia during pregnancy has a negative impact on both the mother and the foetus. Preterm labour, pre-eclampsia, sepsis, and postpartum haemorrhage, as well as an increased requirement for blood transfusions, are all maternal consequences. 5-9 Intrauterine growth retardation and an increased risk of preterm deliveries and low birth weight kids are linked to maternal anaemia. As a result, there is more prenatal morbidity and death, as well as a higher newborn mortality rate. As a result, it's critical to treat prenatal anaemia before it causes serious difficulties. The possible consequences of maternal anaemia on unfavourable maternal obstetric and birth outcomes have been investigated in several main research studies. However, the findings from different research are inconsistent, making it difficult to develop evidence-based policy to mitigate these negative outcomes. For example, maternal anaemia has been identified as a risk factor for pre-term birth (PTB) in a few studies 10,11, although no significant relationships have been found in other research. 12,13. Furthermore, anaemia during the first trimester of pregnancy has been linked to an increased incidence of PTB 14,15, however other research 16,17 have shown inconsistent results. Other negative outcomes, such as low birth weight (LBW), stillbirths, short for gestational age (SGA), and perinatal death, have similar inconsistencies described 12,16,18,19,20. The purpose of this study was to determine the real consequences of maternal anaemia on newborn outcome.

Methods

the study was conducted as an observational study. There was no special intervention carried out for the aim of research. The research included all women who went to the hospital for delivery at or after 37 weeks of pregnancy and had a haemoglobin level of less than 11 grammes per deciliter. The necessary information was gleaned from the patient's medical history and prenatal record. Their haemoglobin levels were checked to see if they were anaemic. The remaining data was obtained after the baby was born. The research was carried out at the Abbottabad Women and Children's Hospital's Department of Obstetrics and Gynecology. This is a tertiary care facility

with a 3500 annual delivery rate. **Inclusion Criteria:** All women with singleton pregnancy of gestational age at or >37 weeks. Age 19-40 years. Both primiparous and multiparous. All pregnant women with anaemia who came to our institute for delivery were included. Pregnant women who had one or more of the following conditions at the time of admission were excluded: Diabetes mellitus. Hypertension is a condition in which the blood pressure (including pregnancy-induced hypertension). Renal or heart disease has been diagnosed. Hemoglobinopathies are a group of diseases that affect the red blood cells (e.g. thalassemia). Multiple pregnancies. This research took a year to complete. Pregnant women were included in the research on a trial basis after giving their consent. Patients' histories were obtained, and their prenatal records were reviewed. They were excluded if they satisfied any of the exclusion criteria. The study enlisted the participation of 170 moms. The cyanmethemoglobin technique (Analyzer–Coulter) was used to measure Hb. The first trimester date scan was used to analyse the pregnancy. A digital scale was used to record the birth weight in kilos. The expectant moms were informed about the study's specifics. Before they were recruited, they gave their informed permission.

DATA COLLECTION PROCEDURE:

The study comprised 170 pregnant patients who presented to the department of Obstetrics and Gynecology at Women and Children Hospital, Abbottabad for birth and met the inclusion criteria after receiving clearance from the ethical review committee. All patients gave their informed permission. Age, gestational age, parity, and BMI were all taken into account. Following that, blood samples were obtained in Ethylenediaminetetraacetic acid (EDTA) tubes, and haemoglobin was calculated. Birth weight, APGAR score, requirement for NICU hospitalisation, and early neonatal mortality were all noted on the babies' case sheets.

RESULTS

Age range in our study was from 19 to 40 years. Majority of the patients 103 (60.5%) were between 26 to 40years. Distribution of patients according to parity is shown in Table III. Majority of patients 123(72.3%) were multi parous. Total no of patients were 170, all having hemoglobin of less 11gm/dl. Mild anemia was present in 92(54.1%) patients. Moderate anemia was present in 56(32.9%) patients and severe anemia was present in 22(12.9%) patients. In this study , babies of low birth weight(<2.5kg) were

calculated to be 26% in patients with mild anemia, 39.2% in moderate anemia while in severely anemic women it was 45.4%. Babies with poor APGAR score were 11.9% in mildly anemic women, 26.7 % in women with moderate anemia and 40.9% in women with severe anemia. In women with mild anemia, 15.2% of neonates required admission to NICU, while 16% of the neonate of moderately anemic women also required admission to NICU but this percentage reached to a significant value of 36.3 % in severely anemic women. High Frequency (13.6%) of early neonatal death was only observed in women with severe anemia.

Table-I: Age distribution of patients (n=170).

Age (in years)	No. of Patients	%age
19-25	67	39.4%
26 to 40	103	60.5%

Table II: neonatal outcome of maternal anemia (n=170)

PARAMETER	Severity of anemia according to WHO classification		
	Mild anemia n=92	Moderate anemia n=56	Severe anemia n=22
APGAR score(at 5min less than7)	11(11.9 %)	15(26.7 %)	09(40.9 %)
Still birth	00	00	2(9%)
Low birth weigh	24(26%)	22(39.2 %)	10(45.4 %)
Early neonatal death	1(1.08%)	1(1.7%)	3(13.6%)
Need for admission to NICU	14(15.2 %)	09(16%)	08(36.3 %)

Table-III: Distribution of patients according to parity (n=170).

Parity	No. of Patients	%age
Primiparous	47	27.61
Multiparous	123	72.3

Table-IV: Distribution of patients according to BMI (n=170).

BMI (kg/m ²)	No. of Patients	%age
<20	42	24.7%
20 to 30	95	55.8%
>30	33	19.4%

DISCUSSION

Anemia is one of the most frequent dietary deficiencies seen across the world. Nutritional anaemia affects people of all ages and genders, although it is more common in women, and it leads to maternal morbidity and death, as well as low birthweight. 21 In Pakistan, anaemia affects 26% of married women aged 15 to 44 in urban areas and 47% of married women aged 15 to 44 in rural regions. 22 Anemia is common among pregnant women in metropolitan areas, with rates ranging from 29% to 50% among pregnant women visiting prenatal clinics in a big private tertiary hospital in Karachi 24,25.

54.1 percent of the women in our research had mild anaemia, 32.9 percent had moderate anaemia, and 12.9 percent had severe anaemia. Anemia was found to be prevalent in pregnant women in Northern Tanzania, with 74.5 percent having mild anaemia, 20.9 percent having moderate anaemia, and 4.5 percent having severe anaemia, according to a research. In our study, the total frequency of low birth weight newborns was 32.9 percent, but Tuba Mehmood et al found that 59 percent of anaemic women's babies had low birth weight²⁶⁻²⁷.

In our study, 40.9 percent of the neonates of severely anaemic mothers had a low APGAR score, whereas another study found that newborns of anaemic women had poor Apgar scores of 5 at 1 minute and 7 at 5 minutes. In one local research, anaemic moms were 1.8 times more likely to have a lower Apgar score at delivery. 28 36.3 percent of neonates born to very anaemic mothers needed to be admitted to the NICU. Similar findings have been found in research from impoverished countries such as Sudan, Tanzania, and Bangladesh. In these nations 28-35, low placental weight, LBW/very LBW, poor APGAR score, SGA, birth asphyxia, foetal anaemia, stillbirth, and early delivery are all linked to maternal anaemia. In our study, severely anaemic women had a higher rate of stillborn babies and early neonatal death (9 percent and 13.6 percent, respectively), whereas in an Indian study, all mothers of stillborn babies and those who died in the womb were anaemic. 37 Many additional studies have found that anaemic moms had a greater risk of in-utero death and perinatal mortality 36-38.

CONCLUSION

In our country like many other developing countries, There is a significant incidence of maternal anaemia, which is linked to a higher frequency of unfavourable newborn outcomes such as low birth weight, low

APGAR score, and stillbirths. All these neonatal outcome measures become severe with increasing severity of anemia. Provision of regular antenatal care and iron supplementation and public awareness can reduce the consequences of maternal anemia.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

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CONFLICT OF INTEREST: No competing interest declared.

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